

Appl. No. 10/089,135
Amdt. Dated 09/27/2004
Reply to Office action of 7/01/2004

REMARKS/ARGUMENTS

Status

This Office action is responsive to communication filed March 25, 2002.

Claims 25-48 are pending, of which
claims 25-38 are rejected
claims 39-48 are withdrawn from consideration

Preliminary Matters

Claims 38-48 are canceled herewith.
Although the election was made "with traverse", no traverse is presently being made.

Claim Rejections -35 USC 112

6. Claims 25-38 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims appear to be requiring the pneumatic tire in combination with the patch, however throughout the claims there is confusing language appearing to require only the patch. For example, in claim 1 (sic) line 4 applicants recite a patch having a first side "for mounting" against the innerliner of the tire instead of -- mounted -- against the innerliner. Also, claims 26-28, 35, 36, and 38 do not appear to further limit the tire and patch structure of claim 1 (these claims only describe features of the intended electronic tag and do not appear to require any further structure in the claimed tire and patch assembly).

Claim 25 is amended herewith to recite:
Combination of electronic tag and patch for mounting the electronic tag within a pneumatic tire ...

Newly-presented claim 49 is directed to a tire.

Double Patenting

7. Applicants are urged to maintain a clear line of demarcation between the claims in this application and the claims in Phelan et al. (6,255,940) and Phelan et al. (6,624,748) having a common inventor with this application in order to avoid any potential double patenting issues.

Applicant notes that the sole independent claim of 6,255,940 is:

1. In conjunction with a pneumatic tire having a tread, a radially-extending belt disposed radially inwardly of the tread and an innerliner forming the interior surface of the tire cavity, apparatus for mounting an electronic tag within the tire, characterized by:
a patch having a first side for mounting against the innerliner of the tire, a second arcuately-shaped side and an internally threaded member extending to the arcuately-shaped side;
the electronic tag having a pressure sensor located at the bottom of a tubular shaped air inlet structure opening at an upper surface of the electronic tag, an internally threaded nut having

Appl. No. 10/089,135
 Amdt. Dated 09/27/2004
 Reply to Office action of 7/01/2004

one end disposed within the electronic tag and an opposite end extending outward a distance "d" from the upper surface of the tag, an externally threaded member threaded into internally threaded nut and extending through the upper surface; and

the externally threaded member being threaded into the internally threaded member so that the opposite end of the internally threaded nut is abutted against the internally threaded member whereby the upper surface of the tag is spaced from the second arcuately-shaped side of patch ensuring that the air inlet structure is open to the tire cavity.

Applicant notes that the sole independent claim of U.S. 6,624,748 is:

1. Method of monitoring conditions of a pneumatic tire, the pneumatic tire comprising a central tread, one or more belt(s) disposed radially inwardly of the tread and an innerliner disposed radially inwardly of the belt, the belt(s) having a side edge, comprising disposing an electronic tag and associated condition sensors within the tire, characterized by:
 - sensing a first temperature which is the temperature of the tire innerliner substantially immediately radially inward of the belt edge with the electronic tag;
 - sensing a second temperature which is the air temperature within the tire with the electronic tag; and
 - sensing air pressure within the tire with the electronic tag.

Claim Rejections -35 USC 102

9. Claims 25-29 and 34-38 are rejected under 35 U.S.C. 102(e) as being anticipated by Koch et al. (6,030,478).

See the embodiment of Figures 2 and 8: vulcanized rubber patch 120 with arcuate sides bridging the tag-receiving side and the side mounted against the innerliner of the pneumatic tire, tag-receiving side including housing (nut) 124 with internal threads 122 for receiving tag assembly 110. As to claims 26-28, 35, 36, and 38, see paragraph 6 above.

Claim Rejections -35 USC 103

12. Claims 30-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koch et al. (6,030,478) in view of DE 37 05 617 A1 and EP 0 389 406 A2.

See paragraph 9 above: the claimed positioning of the patch along the innerliner appears to be conventional in the art according to the parameters desired to be sensed by the electronic tag, as evidenced by DE '617 and EP '406 for example (see the international preliminary examination report for this application). It would therefore have been obvious to one of ordinary skill in the art to provide such conventional positioning of the patch in the Koch et al. tire and patch assembly.

The Present Invention

The elected invention is generally directed to a patch 70 for mounting an electronic tag 40 within a tire 10. Figure 1 shows the tire, patch and tag. Figure 2 shows in greater detail the patch and tag.

As noted in the specification (page 7 line 31 to page 8 line 5)

Appl. No. 10/089,135
Amdt. Dated 09/27/2004
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The tag 40 also includes structure 60 for connecting the tag 40 to the tire 10. The connecting structure 60 preferably includes a first internally threaded nut 62, and an externally threaded bolt 64. The bolt 64 is permanently threadably connected to the first nut 62 and has a threaded portion 64 thereof extending from the tag 40. The tag 40 is preferably entirely encapsulated in a encapsulation material 65 such as a mixture of epoxy and glass beads coated with urethane.

As noted in the paragraph on page 8 lines 10-30:

The encapsulated tag 40 (Figure 2) is preferably not directly connected to the innerliner 35 of the tire 10. Rather, according to the invention, a vulcanized rubber patch 70, having embedded therein a second internally threaded nut 71, is affixed to the innerliner 35 of the tire 10. Preferably, the patch 70, has a lens-shaped transverse cross-section, defined by a substantially flat side 72 having a generally circular perimeter being connectable to the innerliner 35 of the tire 10 and an arcuately-shaped inner side 73 disposed on the opposite side of the patch. Side 72 of the patch 70 is dimensioned for disposition in abutment with the substantially arcuately shaped area of the innerliner 35 of the tire 10 at the shoulder portion 28 thereof. Side 73 of the patch 70 faces the interior of the tire 10. The encapsulated tag 40 has a substantially rectangularly-shaped transverse cross-section and includes a substantially straight side 74. The encapsulated tag 40 is connected to the patch 70 by threadably connecting the bolt portion 64A, extending from the tag 40, to the second nut 71. Due to the arcuate shaped transverse surface 73 of the patch 70, the side surface 74 of the attached tag 40 is separated from the patch 70 along substantially one-half of the arcuately shaped surface 73 of the patch 70. A generally circular central portion 73A of the surface 73 is substantially in abutment with surface 74 when the bolt portion 64A of the tag 40 is threadably connected to the nut 71 of the patch 70. Concurrently, the bolt portion 60 (Figure 1) of the connected tag 40 is located substantially in abutment with an area of the innerliner 35 adjacent to a belt edges 21 at the shoulder portion 28 of the tire 10 for sensing the temperature thereat. While the connected tag 40 is preferably located at the shoulder portion 28 adjacent to the ends of the one or more belts 20,22, it is also within the terms of the invention to locate the tag 40 near or on the center line 14 of the tire 10.

As further noted (page 9, lines 3-5):

The aforesaid arcuate transverse cross-section of the patch 70 (Figure 2) is believed to prevent the patch 70 and attached tag 40, or the tag 40 and attached nut 71, from separating from the tire 10 in the course of rotation thereof ...

... It has been determined that when the inwardly extending side 73 of the patch 70 is arcuately shaped as shown in Figure 2, the patch 70 is able to flex without imposing

Appl. No. 10/089,135
Amdt. Dated 09/27/2004
Reply to Office action of 7/01/2004

significant flexure stresses on the attached tag 40.

As further noted (page 7, lines 3-11)

... electronic tire tag 40 (Figures 1 and 2) is preferably fixedly secured to the innerliner 35 of the tire 10 at an area thereof which is located substantially directly radially-inwardly of a side edge 23 of the belt 20 that is closest to the innerliner 35 of the tire 10 and thus adjacent to a shoulder portion 28 of the tire 10. Since the tag 40 is thereby located adjacent at the an area of the innerliner 35 where the tire 10 is thickest and least able to dissipate heat, the temperature measurements taken at this location are the most closely related to determining whether or not an internal breakdown of the tire 10 is imminent.

Arguments Traversing the Rejection(s)

Koch (6,030,078) discloses method and apparatus for removably inserting an electronic tire tag into a tire. A rubber patch (10) is permanently assembled to the inner liner of a tire. The patch has a cavity (14). An electronic tag (70) has a shape which allows it to be inserted into the cavity in the patch. See Figure 1. The patch (hence the tag) is located at the Equatorial Plane of the tire, at an axial midpoint of the tread. See Figure 2. A lock pin (76) or self-tapping screw (column 6, line 44) can be used to secure the tag in the cavity. See Figure 6. Alternatively, the whole tag assembly (110) can be formed with an external thread (112) and screwed into a rubber patch (120) having internal threads (122). See Figure 8. Or, a bayonet-type mount can be effected. See Figure 9. The following features are of particular interest:

- the insertion of the tag into a cavity of the patch, shown in Figure 1;
- the location of the patch in the center of the tread, shown in Figure 2.
- the completely externally-threaded tag, shown in Figure 8.

The tag of the present invention is not inserted into a cavity of the patch. The patch does not have a cavity for receiving the tag.

As set forth in claim 25, the patch of the present invention has an internally threaded member (71) for threadably receiving an externally threaded member (64) having a portion extending from a side (74) of the electronic tag (40). This arguably reads, only in the very broadest sense, on the apparatus of the D1 document. However, claim 25 further recites that the tag is not received within the patch, but rather is external to the patch, and abuts the patch. This is a non-obvious feature of the present invention, and is not suggested by Koch.

The tag is flat where the externally threaded member extends therefrom (see claim 27: canceled claim 35. Therefore, there is a kind of "one point" or "pivotal" attachment between the tag and the patch, effected by the externally threaded member that screws into both, and this relieves flexure stress, as discussed hereinabove.

The patch (hence tag) of the present invention is not located at the center of the tread section of the tire. Rather, in use, it is located adjacent a shoulder portion of the tire (see claim 30), where

Appl. No. 10/089,135
Amdt. Dated 09/27/2004
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the tire is thickest (see **claim 31**) and least able to dissipate heat (see **claim 32**), thereby facilitating sampling temperature at an area closely related to determining (predicting) breakdown of the tire (see **claim 33**). These features are not suggested by the Koch.

The secondary references DE 37 05 617 A1 and EP 0 389 406 A2 are used only in rejecting dependent **claims 30-33**, discussed hereinabove.

Newly-Presented Claims and Claim Count

Claims 39-48 are canceled herewith.

Claim 26 is canceled herewith.

Claim 35 is canceled herewith.

That leaves **claims 25, 27-34, 36-38**, a total of 12 claims, one independent.

Newly-presented claim 49 is directed to a tire, and is similar to claim 25.

Newly-presented claim 50 is similar to claim 28.

Newly-presented claims 51-55 are similar to claims 30-34.

56 37

Claims 49-56 total 8 claims, one independent.

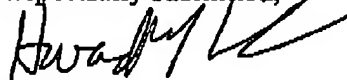
The total is 20 claims, 2 independent.

Conclusion

In view of the examiner's restriction requirement, applicant retains the right to present the non-elected claims in a divisional application.

Favorable examination and consideration are respectfully requested. Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,



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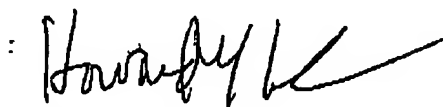
Appl. No. 10/089,135
Amdt. Dated 09/27/2004
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